

DATE: 11 March 1970

To : Dr. J. Lederberg

FROM : David Peter Sachs

SUBJECT: Crowding Pathology

About the best statement I could find regarding crowding and human problems was in John B. Calhoun's Scientific American article, from 1962. I talked with Ann Ehrlich. She confirmed my thought that Paul has written nothing on this topic and that they have run across very little. All she could recommend was the Calhoun article. Relevant quotes and my comments follow.

"In the celebrated thesis of Thomas Malthus, vice and misery impose the ultimate natural limit on the growth of populations. Students of the subject have given most of their attention to misery, that is, to predation, disease and food supply as forces that operate to adjust the size of a population to its environment. But what of vice? Setting aside the moral burden of this word, what are the effect of the social behavior of a species on population growth -- and of population density on social behavior?" [Calhoun, John B. "Population Density and Social Pathology," Scientific American, Vol 206, No. 2 (1962), 139.]

The balance of the article uses this lead paragraph as a jumping off point to report and discuss his studies with Norway rats and crowding. The implication being a generalization of the rat studies to human, urban problems. Using what Calhoun calls twice the number of rats per cage than normally arranged, he observed the following behavioral changes.

- 1) "Many [females] were unable to carry pregnancy to full term or to survive delivery of their litters if they did."
- 2) Males exhibited bizarre sexual habits, engaged in cannibalism, and displayed behavior ranging from "frenetic overactivity to a pathological withdrawal from which individuals would emerge to eat, drink, and move about only when other members of the community were asleep."
- 3) Females lost nest building abilities and other ~~ing~~ mothering traits.
- 4) Males displayed unusually aggressive sexual behavior toward females, even though not in estrous. Other males developed homosexual behavior, a characteristic normally not seen in rats.

Calhoun is not blatantly stating that crowding causes similar phenomena among people, but he does clearly imply it.

I checked through likely prospect for statements on this in The Environmental Handbook but could find nothing relevant. Should I turn anything additional up between now and Friday, I shall direct it to you.